

**Remarks**

Reconsideration and allowance in view of the comments which follow are respectfully requested.

In the Office Action dated April 11, 2007, the Examiner rejected claims 1-23 as being allegedly obvious over Montana Burst in Gram Faceting Designs (GFD) "Montana Burst" in view of Grossbard U.S. Patent No. 4,020,649. The Examiner recognizes that the pending claims recite that the correct lengths are substantially less than the side lengths of the crown and table, and recognizes that Montana Burst has the same lengths for the corner and side, in what is essentially an octagon cut with eight sides, cut that way for the "roundish" material to which it is directed.

The Examiner cites the Grossbard '649 patent which relates to a rectangular (sometimes called emerald cut) having short corners, two longer sides and two shorter sides.

There are many differences between the Montana Burst reference and the Grossbard reference which would keep persons of ordinary skill in the art from combining any features from these two stones.

As described in the Declaration of Robert S. Greeff ("Greeff Dec.") being submitted herewith the design of a gemstone is an intricate process which takes into account many different factors. The design should take into account the desired brilliance, both external and internal. External brilliance is the amount of light which impinges onto the top of the stone and reflects back, rather than being refracted inward. Internal brilliance is determined by light which enters the top or crown, gets reflected off the pavilion facets and back out through the crown as undispersed light. Another factor is dispersion or fire, which refers to how the white light is broken up into its spectral colors. Dispersion is maximized when a ray of light is reflected totally from based facets and strikes the ground facets at the greatest possible angle. Another factor is scintillation which is an indication of the different light patterns obtained when the stone is moved under the light.

The design of a gemstone involves how to achieve the desired combination of brilliance, dispersion and scintillation, and involves the careful design of the cut and facet arrangement in the

crown and pavilion, along with the placement and angles of the facets. One of the most important factors in designing a gemstone facet arrangement is the index of refraction ("IR" or sometimes "RI" for refractive index). Each stone material has a characteristic IR and some have a double IR or birefringement. Diamond has an IR of 2.41 and corundum (which includes sapphire) has an IJR of 1.76 and actually has double IRs at 1.76 and 1.77. Other important differences between different types of stones include hardness and density. For example, diamond has a hardness of 10 on the Mohs' scale and corundum (which includes sapphire) has a hardness of 9. This may seem like a small difference, but there is actually a very big change in hardness from 10 to 9 compared to the change between other numbers in the scale. Depending on the method of hardness measurement used, a diamond can be 10 to 150 times harder than corundum at 9. Diamond has a density of  $3.52 \text{ g/m}^3$ .

The IR of a given stone plays a big role in how the cut and facet arrangement will affect the brilliance, dispersion and scintillation of a gemstone. A certain cut and facet arrangement for a diamond will produce much different brilliance, dispersion and scintillation results than the identical cut and facet arrangement for a corundum material due to the different characteristic IRs. Due largely to the different characteristic IRs, one skilled in the art would not look to facet arrangements used for one type of material for guidance or suggestion on how to make a cut and facet arrangement for another type of material.

Accordingly, the design of a gemstone should not be trivialized by simply taking facet arrangements of one existing design and then moving them around or modifying them based on selected features present in another gemstone design, absent a specific reason or motivation for doing so based on the designer's intent, type of stone, and effect sought to be achieved. Each gemstone design is made for a particular purpose to carry out the designer's intent on achieving his desired balance of brilliance, dispersion and scintillation. While it may be tempting to simply combine features of one stone with those of another, this would run contrary to the designer's intent of those existing stones, and contrary to the teachings.

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Montana Burst is directed to a stone which is considered by those of ordinary skill in the art to be very different than that of Grossbard.

Some of the different distinguishing features of the Montana Burst and Grossbard are as follows:

<u>Montana Burst</u>	<u>Grossbard</u>
1. Directed to stone material having IR of 1.76 (corundum, specifically sapphire) (Montana has sapphires and spinels, but no diamonds)	Directed to diamond having IR of 2.41
2. Crown has <u>unequal</u> steps	Crown has <u>equal</u> steps
3. Octogon (8 <u>equal</u> sides)	Emerald (cut-cornered rectangular)
4. All <u>eight</u> pavilion sides have equal lengths	Four pavilion sides are <u>different</u> from four pavilion corners, and two opposing sides have different lengths than the other opposing sides
5. <u>All</u> pavilion rib lines originating at girdle extend in a straight line	<u>None</u> of the pavilion rib lines in a straight line to culet
6. <u>None</u> of pavilion rib lines have a culet break	<u>All</u> pavilion rib lines have a culet break

The Montana Burst is directed to a corundum (sapphire or spinel) which has an IR of 1.76, different from a diamond of 2.41. Based on the Greeff Dec. discussed above, applicant urges that it would not have been obvious to modify the eight equal sided design of Montana Burst to have corners substantially shorter than its sides like that in Grossbard '649 because of the difference in the IRs of the stone material, the shape of the raw material and the designer's intent for each of the designs.

Another important factor in designing a gemstone facet arrangement is the crystal structure of the material. Diamond has a "cubic" crystal structure having three crystal axes at right angles ( $90^{\circ}$ ) to each other and of equal lengths. In contrast corundum has a "hexagonal (trigonal)" crystal structure having three like planes of symmetry intersecting at angles of  $60^{\circ}$  in the vertical axis.

The corundum (sapphire) crystal structure of Montana Burst is trigonal. Due to the trigonal crystal structure of the material, and the roundish shape of the row or rough material, the designer tried to obtain the most weight out of the rough and selected an equal octagon cut. One of ordinary skill in the art would not be motivated to change the outline of the finished cut in Montana Burst to have four corners substantially shorter than the sides like that in Grossbard '649, because this would substantially reduce the yield of the stone.

Corundum with its low RI of 1.76 has a much lower characteristic dispersion than diamond which has a relatively high RI of 2.41. In order to achieve the best overall combination of brilliance, dispersion and scintillation, the designer selected a crown having three non-equal height steps, the top being the smallest, the middle being the largest and the bottom being between the top and middle in terms of size. One skilled in the art would not be motivated to modify Montana Burst to have the Grossbard '649 crown for the reasons above, and also because having equal height steps in Montana Burst would severely reduce the brilliance of the corundum cut, which is already low due to its low RI of 1.76. The Grossbard '649 patent is directed to diamond material having a very high RI, and consequently a much higher characteristic dispersion, and having equal height steps can be employed, giving the diamond a classic look while still providing the diamond with a substantial dispersion.

In summary, due to the type of material (corundum) used in Montana Burst, with its characteristic crystal structure and dispersion, and due to the shape (roundish) of the rough material, and its selected unequal height steps, one skilled in the art would not be motivated to change the shape of the finished cut from equal octagon to cut-cornered with four sides shorter than four sides, and equal height steps like that of Grossbard '649.

In view of the differences in stone type, shape, pavilion facet arrangement and pavilion rib line arrangement, applicant urges that one skilled in the art views the Montana Burst and Grossbard as different designs achieving different objectives and that one would not have been motivated to modify the Montana Burst to have corners substantially shorter than its sides.

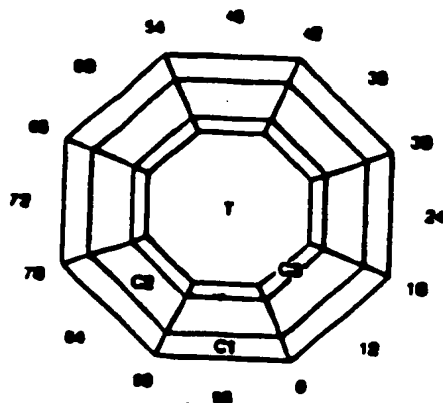
Further, even if a person of ordinary skill in the art was selectively given the Montana Burst and

Grossbard and was asked to arrive at a modified design based on these two references, there is no reason why that person would have arrived at a modification proposed by the Examiner, instead of some other modification. Applicant urges that the proposed modification was arrived at through hindsight, using applicant's disclosure as a guide, which is not a proper way to evaluate obviousness.

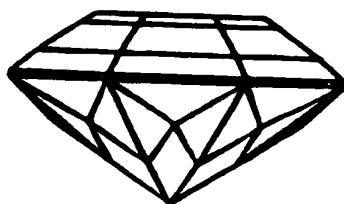
Applicant believes that it is improper to use applicant's claim as a guide comparing the present claims to the Montana Burst, see what is different, and then hunt for that different feature in other prior art. This is classic hindsight reconstruction which is improper. The true test is whether the claimed design would have been obvious in view of the prior art. When making this assessment, applicant urges that one must look at the prior art references as a whole to see what they suggest about making any such proposed combination. Assuming one started with the Montana Burst as the starting point, one of ordinary skill in the art would first ask himself whether there would be any motivation to make any modifications to the stone, or to combine features of this stone with another stone, based on a host of features including the IR of the stone material. The Montana Burst goes to great lengths to detail a facet arrangement and cutting angles for the particular Montana material (Corundum such as sapphire or spinel, not diamond), based on the intent to achieve a particular stone having a certain brilliance, dispersion (or fire) and scintillation, and given the shape of starting material (round). There is no evidence why one would seek to deviate from the detailed specification for this stone. The same can be said for the specifications of the Grossbard stone.

Without reference to the present claim language (which provide a blue print or roadmap of the invention), assuming one skilled in the art has as the starting point the Montana Burst and has access to all of the other prior art, there is not reason why he would then look to the Grossbard patent (relating to a cut-cornered rectangular diamond) for possible ways to modify the Montana Burst corundum stone. As described above, there are at least six major differences between the Montana Burst and Grossbard which together lead one to view these stones as different. Applicant urges that there is no teaching or suggestion or other information sufficient to provide a motivation to modify the Montana Burst stone to have crown corners, substantially shorter than the crown sides.

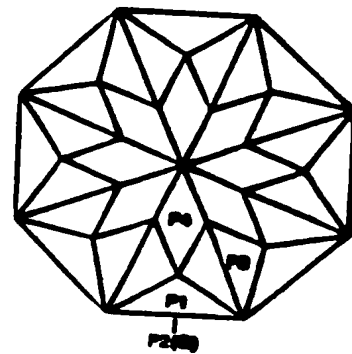
**Montana Burst**  
**Top**



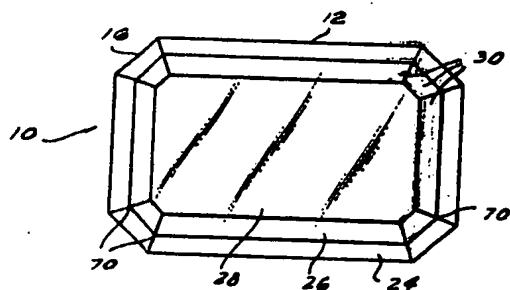
**Side**



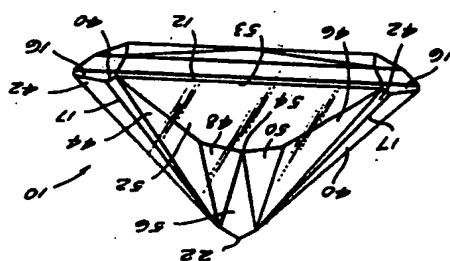
**Bottom**



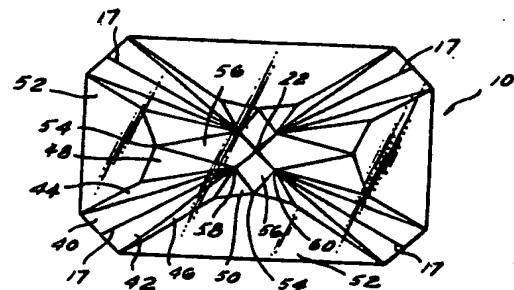
**Grossbard**  
**Top**



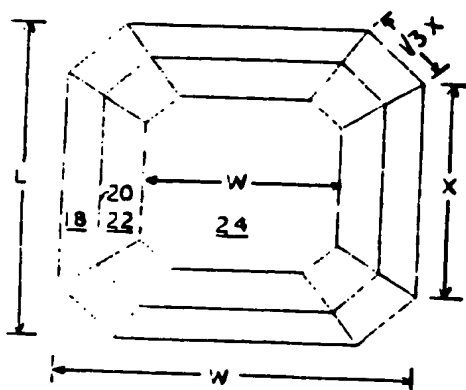
**Side**



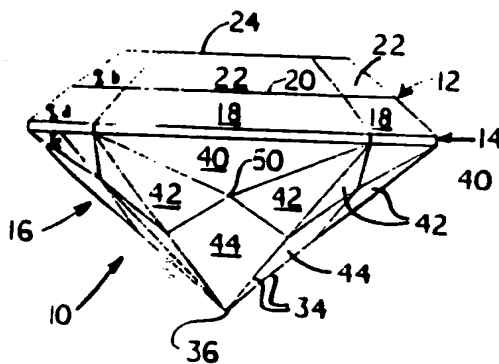
**Bottom**



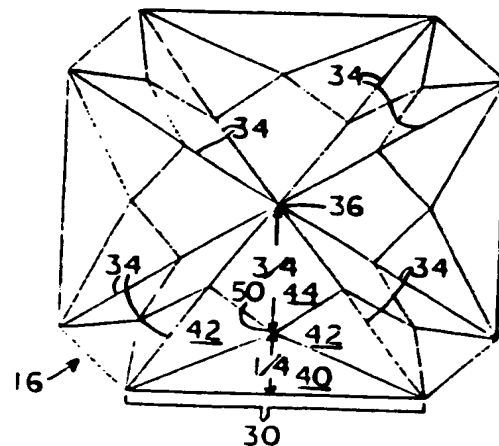
**Subject Patent**  
**Top**



**Side**



**Bottom**



In view of the many differences between the Montana Burst and Grossbard as evident from the drawing Figures above and the differences listed above, applicant urges that one skilled in the art would not be motivated to combine Montana Burst with Grossbard. Even if one would be motivated to combine them, there is no reason why one would select certain features of Montana Burst (discarding others) and combine them with certain features of Grossbard (discarding others) to approach the design shown in the subject patent figures above, as compared to some other structure.

Applicant respectfully submits that the case of In re Seid cited by the Examiner for the general statement that “matters relating to ornamentation only, which have no mechanical function, cannot be relied upon to patentably distinguish the claimed invention from the prior art” is not applicable to the presently claimed invention.

The invention at issue in the Seid case was an advertising display device in the form of an ordinary bottle for beverages together with a hollow member (representing a human figure from the waist up) which is adapted to fit over and cover the neck of the bottle. The claim at issue in that case recited the particular shape and arrangement of the upper part of the body of the hollow member. The CCPA held that those features “relate to ornamentation only and have no mechanical function whatever.”

In the present case, the present claims recite a gemstone. As described in the specification, gemstones have characteristic features of brilliance (internal and external), dispersion and scintillation. The type of cut (brilliant, step or mixed) and the shape and arrangement of the facets determines the characteristic brilliance, dispersion and scintillation, because of how the incident light is reflected and other wise directed and broken up inside the gemstone.

The arrangements of facets, therefore, do more than merely provide an ornamental appearance on the exterior of the stone. This may be true if all light is ignored and the stone were represented by a solid material such as solid wood. However, because a gemstone’s mechanical function is determined by how it will reflect and otherwise direct incident light, the facet arrangement



performs a mechanical function. In this respect the claimed gemstone is not like the device claimed in the Seid case. In view of this significant and important distinction, applicant respectfully submits that the principle of the Seid case relied upon by the Examiner should not serve to treat the faceting arrangement as merely an ornamental exterior feature, because the faceting arrangement determines the how the gemstone will mechanically function to provide properties of brilliance, dispersion and scintillation.

Many utility patents have issued for gemstones since the Seid decision, and all gemstones have (in addition to mechanical properties as determined by their facet arrangements) ancillary ornamental properties. The mere fact that facets have ornamental properties does not exclude such facet features from being considered for patentability. The Seid case was clear in that it stated that only if a feature had no mechanical function (and only ornamental function), the feature would not be considered for patentability. Gemstones have mechanical internal optical properties just like lenses, prisms and other structures which redirect incident light internally and direct some of the light externally. All of these structures have been long recognized to constitute patentable subject matter, and any change in the facet structure will change the mechanical function of the structure.

In view of the foregoing, applicant believes that the application is in condition for allowance, and such action is earnestly solicited.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicant's undersigned attorney invites the Examiner to telephone him at the number provided below.

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No fee is deemed necessary in Communication with the filing of this Response. However, if any fee is required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

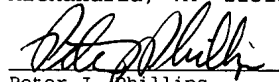
Respectfully submitted,



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